BENCHMARK COST MODEL 2

CABLE CAPACITY FOR SHARED FEEDER PLANT

- Copper
  - Sum of Lines Riding Feeder Segment/Segment Fill Factor

- Fiber For SLC (4 Fibers Until Capacity)
  - 4 Fibers For Capacity Up to 2016 VG Paths
  - 4 Additional Fibers For Each Increment of 2016 VG Path

- Fiber For AFC (4 Fibers Until Capacity)
  - 4 Fibers For Capacity Up to 672 VG Paths
  - 4 Additional Fibers For Each Increment of 672 VG Paths

Sprint.

BENCHMARK COST MODEL 2

FEEDER & DISTRIBUTION CABLE SIZE

- Each Feeder Segment Cable Size Determined From Segment Capacity

- If Max Size Cable < Capacity, Then # of Max Size Cables Plus Next Cable Size to Meet or Exceed Capacity

Sprint.

BENCHMARK COST MODEL 2

FEEDER & DISTRIBUTION CABLE SIZE

- Fiber Cable Table (# Strands)
  - 12, 18, 24, 36, 48, 60, 72, 96, 144

- Copper Cable Table (# Pairs)
  - (12Dist. Only), 25, 50, 100, 200, 400, 600, 900, 1200, 1800, 2400, 3000, 3600, (4200 Feeder Only)

Sprint.

BENCHMARK COST MODEL 2

FEEDER SEGMENT AND DISTRIBUTION CABLE COSTS

- Feeder Segment Cost = Segment Distance * Cable Cost per foot

- Distribution Cable Cost = Horizontal Distribution Plant Distance * Horizontal Distribution Leg Cost Per Foot * Number of Distribution Legs + Vertical Distribution Plant Distance * Vertical Distribution Leg Cost Per Foot * Number of Vertical Distribution Legs

Sprint.

BENCHMARK COST MODEL 2

STRUCTURE COST

- Structure Cost =

  Density Group/Terrain Specific Cost Per Foot * Cable Length * Copper Cable Size Factor + Number of Maximum Size Cables * Cable Length * Cost Per Foot to Pull Underground Cable Through Conduit

Sprint.

BENCHMARK COST MODEL 2

Structure Activities

- Mix Of Activities Developed Separately for Each Density Group and Each Level of Terrain Difficulty
- Activities Include:

Activity
Plow
Rocky Plow
Trench & Backfill
Rocky Trench
Backhoe Trench
Hand Dig Trench
Bore Cable
Push Pipe & Pull Cable
Cut & Restore Asphalt
Cut & Restore Concrete
Cut & Restore Sod
Conduit

- Developed Weighted Cost Per Foot Based On Percentage of Each Activity and Cost Per Foot of Each Activity
- Cost Per Foot for Activities Based on National Average of Available Contractor Prices

Sprint.

BENCHMARK COST MODEL 2

SWITCHING COSTS

- CLLI Common Switching Costs Per Line =

  (Total CLLI Common Cost * Land & Building Factor * Switch Engineering Factor * Basic Local Service Factor)/(Total Lines Associated With CLLI)

Where:

» Total CLLI Common Cost =

CO Switch Type	Fixed/StartUp $
Remote	250,000
1 - 10,000	400,000
10,001 - 60,000	600,000
60,001 -100,000	900,000
100,000+	1,500,000

Sprint.

BENCHMARK COST MODEL 2

SWITCHING COSTS

- Line Sensitive Switch Costs Per Household =

  Per Line Switch Cost * Land & Building Factor * Switch Engineering Factor / Switch Fill Factor

  Where:

  » Per Line Switch Cost = $100.00

Sprint.

BENCHMARK COST MODEL 2

Circuit Equipment Costs

- Fixed Digital Subscriber Loop Carrier Electronics Remote Terminal Cost Per Line =

  Fixed Terminal Cost/Total Lines Per Terminal

  48 Line Terminal = $ 7,700
  120 Line Terminal = $ 8,500
  240 Line Terminal = $10,500
  672 Line Terminal = $77,330
  1334 Line Terminal = $94,909

- Per Line Costs = $250 for Terminals for < 240 Lines
  $184 for Terminals for > 240 Lines

- Per Line Costs Include Remote Terminal Line Cards, Shelves, Virtual Tributary Units, and All Circuit Equipment at the Central Office

Sprint.

BENCHMARK COST MODEL 2

Annual Cost Factors

Convert Investment to Annual Cost

- **3 Investment Related Factors**
  - Cable and Wire Investment Factor
  - COE Switching Investment Factor
  - COE Circuit Investment Factor
- **Non-Plant Related Expense Factor**

Sprint.

BENCHMARK COST MODEL 2

Annual Cost Factors

Investment Related Factors Reflect Relationship of:

- **+ Return on Investment @ 11.25%**
- **+ FIT, State, and Local Taxes**
- **+ Plant Specific Expenses**
- **+ Plant Non-Specific Expenses**
- **+ Depreciation/Amortization**

To Total Plant for Each Plant Category

Sprint.

BENCHMARK COST MODEL 2

Annual Cost Factors

Non-Plant Related Expense Factor

ARMIS Expenses Include:

- » Customer Operations - Marketing
- » Customer Operations - Services
- » Corporate Operations
- » Other Depreciation / Amortization

Non-Plant Related Expense Per Line = Above Expenses / Total Access Lines

A User Adjustable Factor (Default = .75) is Applied to the Non-Plant Related Expense Per Line.

Sprint.

BENCHMARK COST MODEL 2

BCM2 Input List

USER INPUTS TO MODEL		
Variable	Value	Description
NormalUGDepth	24	Normal Placement Depth in inches for Buried/Underground Copper Cable
NormalFiberDepth	36	Normal Placement Depth in inches for Buried/Underground Fiber
CriticalWaterDepth	3	Depth in feet at which water impacts placement costs
WaterFactor	30	% Cost increase for presence of water within critical depth
ResLinesMultiplier	1.21	Residence Lines per household multiplier
MaxFiberSize	144	Maximum Fiber Cable Size
MaxFeederSize	4200	Maximum Copper Feeder Cable Size
Max DistSize	3600	Maximum Copper Distribution Cable Size
CprMaxDistr	12000	Maximum length of copper cable in the CBG distribution area
NewTerrainTrigger	5	Value that triggers new terrain variable multiplier
NewTerrainFactor	1	Cost multiplier when new terrain variable exceeds trigger point
MinSlopeTrigger	12	Point at which minimum slope effects placement distance
MinSlopeFactor	1.1	Change in distance due to increased average slope
MaxSlopeTrigger	30	Point where presence of very high slope causes yet more cable distance
MaxSlopeFactor	1.05	Change in distance due to a maximum only slope presence
CombSlopeFactor	1.2	Secondary change in distance due to substantial slope presence
EngrInstall	35	Engineering and installation loading factor for electronics
ElectronicFill	0.85	Fill Factors for Electronics
HiCapFill	0.95	Fill Factors for High Capacity Optic Multiplexers
SpecAccRatio	0.13	Ratio of Special Access Lines to Business and Special Access
DensAdjUnits	10	Average Number of Business lines per location
OpticsCost	162000	Average cost for each DS-3 for CO and field DS3 to DS1 multiplexers
CopperT1	1133	Average Cost per DS-1 on copper (both terminals & repeater)
InterofficeSwRatio	1.03	Multiplier to add interoffice trunking cost
	20	Digital Switching Discount % (Enter whole %)
	20	Fiber Cable Discount % (Enter whole %)
	20	Copper Cable Discount % (Enter whole %)
	10	AFC Electronics Discount % (Enter whole %)
	20	SLC Electronics Discount % (Enter whole %)
DropCostPerFoot	0.1	Drop Cost per FT
PedestalCost	48.22	Cost of Pedestal
NidCost	30	Cost per NID

Sprint.

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Input Variables for switching and overheads [1]		
SwitchEngrFactor	1.07	Loading Factor for Switch Engineering
SwitchFillFactor	0.8	Switch Fill Factor
SwLandBldgFactor	1.043	Sw Land & Buliding Factor
NonTrfSen	70.00%	% Non Traffic Sensitive (Enter as decimal)
TrfSen	73.93%	% of Traffic Sensitive that is local (Enter as decimal)
OSPEngrFactor	1.05	Loading Factor for Outside Plant Engineering
FiberSpliceRatio	0.045	Loading Factor for splicing of fiber cable (Enter as decimal)
FiberInLineRatio	0.07	Additive for in line pedestals, cross connects, etc. (fiber)
CopperSpliceRatio	0.07	Loading Factor for splicing of copper cable (Enter as decimal)
CopperInLineRatio	0.1	Additive for in line pedestals, cross connects, etc. (Copper)
CableWireFactor1	0.2328	Factor 1 for cable & Wire Facilities
ElectronicsFactor1	0.2424	Factor 1 for circuit Facilities
SwitchingFactor1	0.257	Factor 1 for Switching facilities
OtherFactor1	133.39	Factor 1 for other loading per line served
OtherAllocRatio1	0.75	Allocation Factor 1 applied to non-plant related expenses
CableWireFactor2	0.2328	Factor 2 for cable & Wire Facilities
ElectronicsFactor2	0.2424	Factor 2 for circuit Facilities
SwitchingFactor2	0.257	Factor 2 for Switching facilities
OtherFactor2	133.39	Factor 2 for other loading per line served
OtherAllocRatio2	0.45	Allocation Factor 2 applied to non-plant related expenses
CprSizeFctr1	1.2	Structure Cost multiplier for cables 401 to 900 pr versus < 400 pr
CprSizeFctr2	1.3	Structure Cost multiplier for cables 901 to 1500 pr versus < 400 pr
CprSizeFctr3	1.4	Structure Cost multiplier for cables 1501 to max size versus < 400 pr
FbrSizeFctr	1.2	Structure Cost Multiplier for fiber cables >60 fibers versus < 60 fibers
UGPullCost	0.77	Cost per ft to pull UG cables into conduit duct

Sprint.

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Distribution UG/Aerial Mix Table		
Density	Below Ground %	Aerial%
0-5	90	10
5-200	80	20
200-650	70	30
650-850	70	30
850-2550	80	20
>2550	90	10

Copper Feeder UG/Aerial Mix Tabl		
Density	Below Ground %	Aerial%
0-5	70	30
5-200	72	28
200-650	75	25
650-850	75	25
850-2550	80	20
>2550	90	10

Fiber Feeder UG/Aerial Mix Table		
Density	Below Ground %	Aerial%
0-5	95	5
5-200	85	15
200-650	70	30
650-850	70	30
850-2550	80	20
>2550	90	10

Density/Fill Table		
Density	Feeder	Distribution
0	0.75	0.4
5	0.8	0.45
200	0.8	0.55
650	0.85	0.65
850	0.85	0.75
2550	0.85	0.8

Sprint.

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Plant Type	Urban/RuraL	Density	Surface Category	Weighted Cost Factor
Distribution	Urban	>2550	RockH	23.59262
			RockS	17.56779
			Normal	13.31148
Distribution	Urban	850-2550	RockH	16.58868
			RockS	10.07238
			Normal	7.62624
Distribution	Rural	650-850	RockH	13.13253
			RockS	7.76892
			Normal	6.07944
Distribution	Rural	200-650	RockH	12.43557
			RockS	6.43722
			Normal	3.48428
Distribution	Rural	5-200	RockH	11.922
			RockS	4.95988
			Normal	2.45968
Distribution	Rural	0-5	RockH	11.95461
			RockS	4.83508
			Normal	1.77132
Feeder	Urban	>2550	RockH	23.59262
			RockS	17.56779
			Normal	13.31148

Sprint.

BENCHMARK COST MODEL 2

MODEL NOTES:

Sprint.

BENCHMARK COST MODEL 2

MODEL NOTES:

Sprint.

BENCHMARK COST MODEL 2

MODEL NOTES:

Sprint.